

The Right Key for the Right Lock

Customer Needs Create Performance Chemicals

Smart Solutions – Present times are tough in business life. The global economy is facing a historical downturn. With multiple roots and links into most major industries, chemical companies experience unpredicted and unexpected severe losses of revenue and earnings. In many cases the downturn threatens the existence of long-term well-established companies. Announcements of insolvencies became more frequent in recent months.



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But indeed, for many Western chemical companies changes started already seven, eight years ago. In recent years they had to struggle with unfavorable cost structures, declining market prices and increasing competition from emerging economies in Asia. Chemical companies were confronted with the dilemma described by Michael Porter's famous



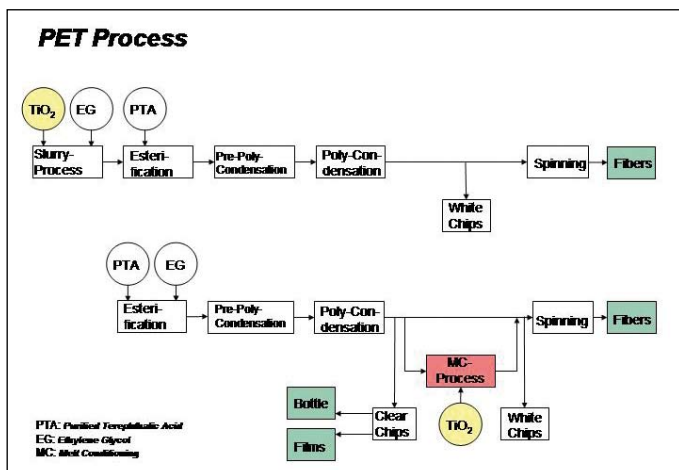


Fig. 1: Process to make PET-fibers

U-curve: either they grow, extend their market share and benefit from scale of economy or they shift their product portfolio into specialties with lower volumes but higher margins.

pay a price with margins at least three to five times higher than for a standard product. Customers are willing to do this when the compound provides significant advantages

“Performance chemicals have a limited life time.”

Those who stuck in between run a high risk to become victims of a shakeout, especially in times like this. What looks easy in theory is difficult in the real world. Management cannot simply turn the switch and move a product- and volume-driven company into a producer of specialties or performance chemicals.

The Nature of Specialty Chemicals?

The term “specialty chemicals” has become rather common in chemical industry. The question is what does that mean? Each chemist can explain the difference between an inorganic and an organic compound. The term “performance chemical” or “chemical specialty” is different. A chemical compound is not a performance chemical per se. This term should only be used when a customer is willing to

to their processes or special functions to their products. In this context, a performance chemical is created by interaction with the customer’s needs. Customer’s significant benefit – either from cost savings or valuable functions – is the only criteria whether a compound is a performance chemical or not. Neither a complicated synthesis nor a complex chemical structure is of importance. Even simple inorganic or organic compounds can become a performance chemical, when they fulfill the aforementioned conditions.

The titanium dioxide industry is very typical in this respect. Having seen good years in the past, most producers are now facing dwindling profits and increasing costs. New players entered the market. Since the year 2000, Chinese TiO₂ capacity grew with an average of 22 % per year from

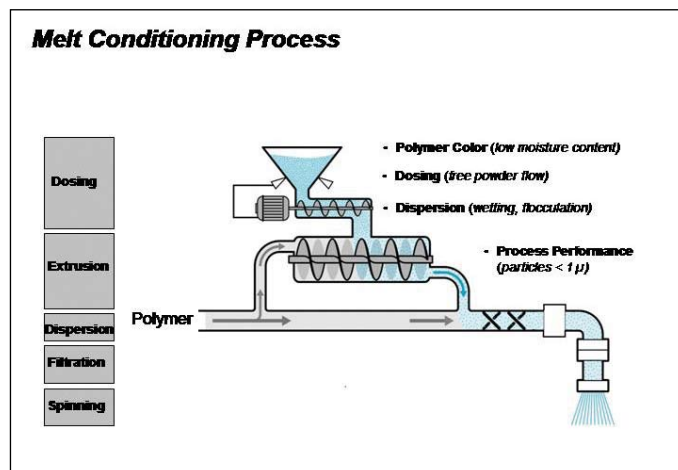


Fig. 2: Requirements for a proper melt conditioning process in PET-fiber process

250 kt to 1.2 mt in 2008. Since nine years prices for standard rutile grades are flat. Profitability decreased constantly.

Sachtleben’s Strategy

20 years ago, Sachtleben in Duisburg (Germany) realized its strategic dilemma. Confronted with high environmental-, labor- and ever increasing energy cost and with limited options to extend capacity, it was decided to focus on markets where the product and technology portfolio could offer advantages. Consequently, the company turned into a leading manufacturer of TiO₂ anatase products for technically demanding markets like synthetic fibers, engineering plastics and pharmaceuticals. Market volumes were limited but customer requirements on quality, functionality and product consistency were high. For

customers with a need for high quality anatase products attractive market niches could be established by Sachtleben. Most of these customers also had a need for technical support. Customers actually were not only buying a pigment but a solution for a technical problem. Therefore Sachtlebens products became a combination of technical service and “the product in the bag”.

In this approach the hidden potentials of standard products have to be unfolded. The performance chemical is the “key”; its application is the “lock”. One needs to find the right key for the right lock. What looks like a search for a needle in a haystack becomes less delicate the more successful findings have been made. In most cases the volume demand is limited. Out of the total global annual consumption of 5 mt TiO₂ e. g. only 0.05 %

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“normal” TiO₂ producers these market segments were too small. More than 80 % of the global TiO₂ productions are rutile pigments of which 60 % are consumed for the preparation of coatings. By finding

is sold as nano TiO₂, 0.8 % for catalysts and for 1.5 % for fiber applications. But margins can be remarkable. In Sachtleben’s product portfolio for special TiO₂ grades, the price spread reaches from

2 €/kg for standard grades to more than 100 €/kg for sophisticated catalysts.

Creation of Individual Solutions

Time is an important factor. Based on the experience of

for an unsearched problem: this solid phase material acts as a highly efficient catalyst to make biodiesel. But not all findings happen randomly.

The development of an innovative melt conditioning process in the polyester indus-

“The nature of a chemical compound as performance chemical is inseparably linked to its application.”

a large number of successful projects it takes between five and ten years from the initial idea to market breakthrough. Sometimes the initial idea comes by accident. For one of our customers we developed a TiO₂ with a certain porous structure, specific surface and surface properties as a solid phase in high-performance liquid chromatography (HPLC). In a test trial a chromatographic column was operated under extremely wrong conditions. After first disappointment a second look offered a solution

try is an excellent example for a planned development. In the standard process for making synthetic fibers, the anatase pigment is added before the esterification and the polycondensation. This process produces always white chips. With growing demand for PET-bottles and -films, producers wanted flexibility to make clear chips when needed. In close cooperation between polymer producer, engineering company and pigment manufacturer a process was developed in which the white

pigment can be added to the polymer after the polycondensation. A new pigment grade had to be developed with low moisture content, free powder flow for reliable metering and excellent surface wetting properties. Process performance and product quality of the conventional process had to be matched. It took seven years to make the concept working. Cost savings, high flexibility and improved polymer quality made customer willing to accept a significant higher price for the process adapted pigment. Figure 1 and figure 2 illustrate the challenges of this project.

This example also illustrates that producers of performance chemicals are innovation partners for their customers. Such projects can be time- and cost-intensive. Only companies with a good reputation as a reliable long term business partner have a chance to be accepted as innovation partners.

This concept bears a number of risks, but margins gained are significantly above

of the performance chemical stops selling, the lifetime of the performance chemical is over. In other words: performance chemicals have a limited life time. Therefore performance chemical companies should have a well diversified product and customer portfolio to balance the risks of unforeseen dropouts. To keep the business stable over time a healthy mix between standard products and performance chemicals is recommendable. In many cases long-term customer relationships with standard products open up opportunities for the development of performance chemicals for special applications.

In a crisis like this also small market segments for performance chemicals are hit. If customers sell less, their demand for performance chemicals is less. But different to standard products even with decreasing sales volumes prices can be kept stable and margins are not destroyed. To execute this concept a company needs a highly motivated workforce with a solid scien-

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the average. The producer of performance chemicals has to understand the value of his product in the whole value chain to find the right price for his product. The problem is not that the price is too high. In such a case customers simply will not buy. The problem is that the prices are too low and margins are given away.

tific and engineering know how, a deep knowledge of the complete value chains an excellent project management and good communication skills. And the whole team has to be curious. Because only curious people have a chance to find the right lock for the key they have in hand.

Limited Life Time

As stated several times in this article, the nature of a chemical compound as performance chemical is inseparably linked to its application. If the product

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